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“Minimum Performance Testing for Aircraft Powerplant Halon Replacement with a Blended Candidate”

Testing occurred during latter 2014 and early 2015 at the Federal Aviation Administration’s W.J. Hughes Technical Center (FAATC) with a blended fire extinguishing agent being considered to replace halon 1301 in an aircraft powerplant fire extinguishment system. Background, experience, and outcomes from this testing are here reported.

Personnel accomplishing the testing represented Airbus, Meggitt Safety Systems Incorporated (MSSI), Technology and Management International (TAMI, an FAATC support contractor), and the FAA. The testing occurred consistent with the fourth revision of the “Minimum Performance Standards for Halon 1301 Replacement in the Fire Extinguishing Agents/Systems of Civil Aircraft Engine and Auxiliary Power Unit Compartments” (MPSHRe rev04). The MPSHRe rev04 is a working draft document that prescribes test fixture, environment, and process to assess halon-replacement candidates for possible use in the powerplant fire extinguishment system of a transport-category aircraft. The evaluated candidate is manufactured by MSSI and named “Blend A”. MSSI Blend A is a composition of CO₂ and FK-5-1-12 (3M Novec 1230).

During testing, several issues required consideration and were adequately addressed. These were (a) an alteration to the test process indicated per MPSHRe rev04, (b) the valid use of a Statham-derivative gas analyzer to sample and report the dispersed concentration field of a tertiary gas mixture, and (c) addressing observed effluent atypically escaping from the test fixture ventilation stream into the encompassing test bay. The significant outcome from this work is the parity with halon 1301 in this particular test environment for MSSI Blend A at 30.6% v/v Blend A.